

## Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirement of Automotive Applications.

## Features

- $BV_{CEO} > -100V$
- Maximum Continuous Collector Current  $I_C = -1A$
- $V_{CE(SAT)} < -220mV @ -1A$
- $R_{CE(SAT)} = 150m\Omega$
- 7V Reverse Blocking Voltage
- High Peak Current
- Complementary Part Number ZXTN25100CFH
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

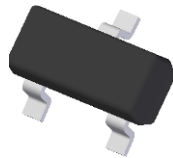
## Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.008 grams (Approximate)

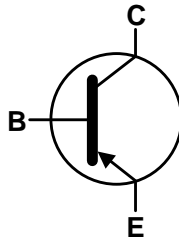
## Applications

- MOSFET and IGBT Gate Driving
- DC – DC Converters
- Motor Drive
- High Side Driver

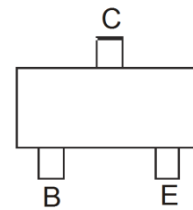
SOT23



Top View



Device Symbol



Top View  
Pin-Out

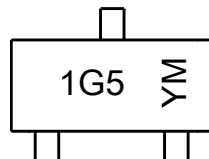
## Ordering Information (Note 5)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXTP25100CFHQTA	Automotive	1G5	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
  5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information

SOT23



1G5 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: F = 2018  
 M = Month ex: 9 = September

### Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	F	G	H	I	J	K	L	M	N	O	P	Q

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

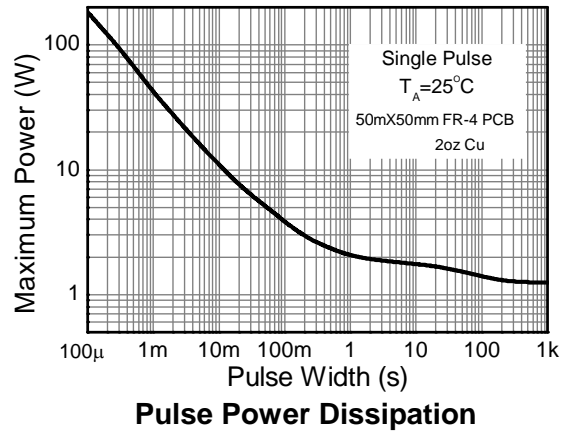
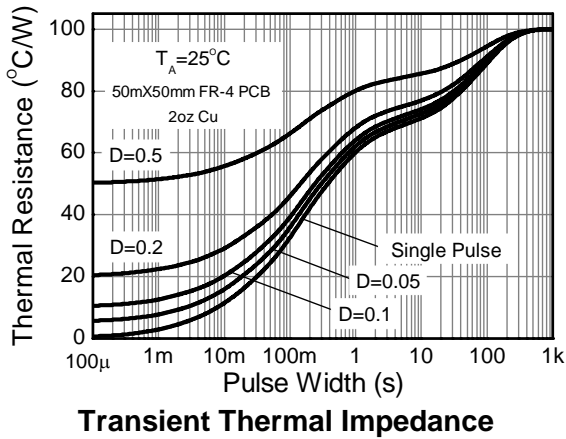
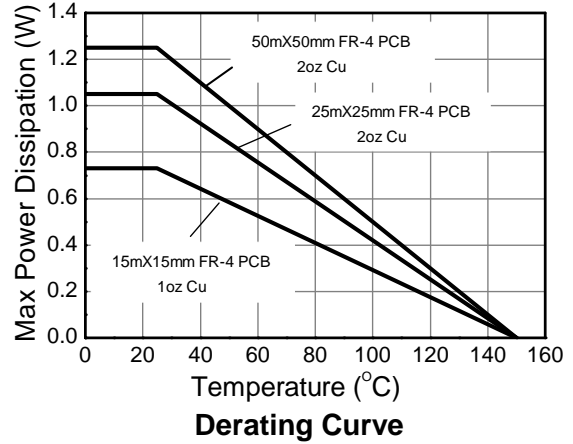
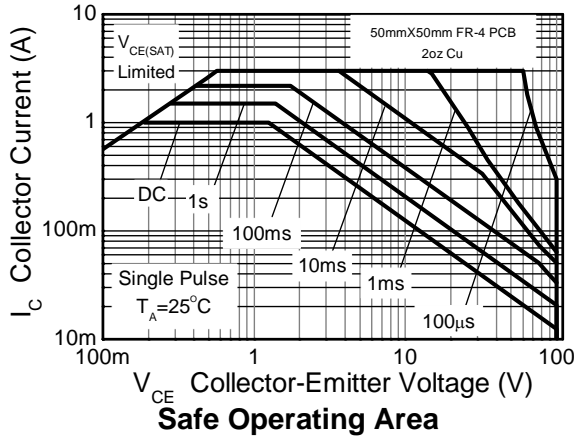
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-115	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-100	V
Emitter-Collector voltage (Reverse Blocking)	V <sub>ECO</sub>	-7	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-1	A
Base Current	I <sub>B</sub>	-500	mA
Peak Pulse Current	I <sub>CM</sub>	-3	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector Power Dissipation	P <sub>D</sub>	(Note 6)	0.73
		(Note 7)	1.05
		(Note 8)	1.25
		(Note 9)	1.81
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 6)	171
		(Note 7)	119
		(Note 8)	100
		(Note 9)	69
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	75.25	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
6. For the device mounted on 15mm X 15mm X 1.6mm FR-4 PCB with high coverage of single sided 1oz copper in still air condition.
  7. Mounted on 25mm X 25mm X 1.6mm FR-4 PCB with high coverage of single sided 2oz copper in still air condition.
  8. Mounted on 25mm X 25mm X 1.6mm FR-4 PCB with high coverage of single sided 2oz copper in still air condition.
  9. As Note 7 above, measured at t < 5 secs.
  10. Thermal resistance from junction to solder-point (at the end of the collector lead).

**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

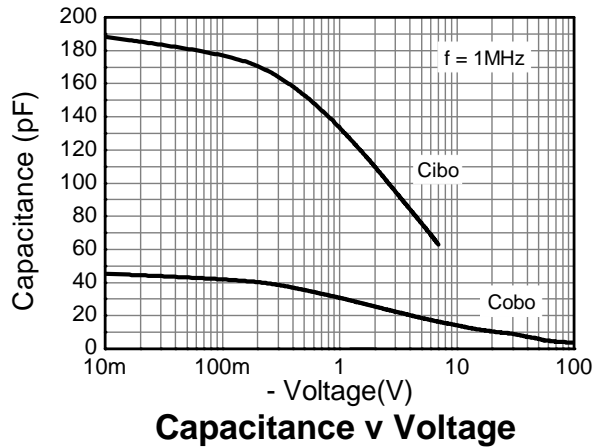
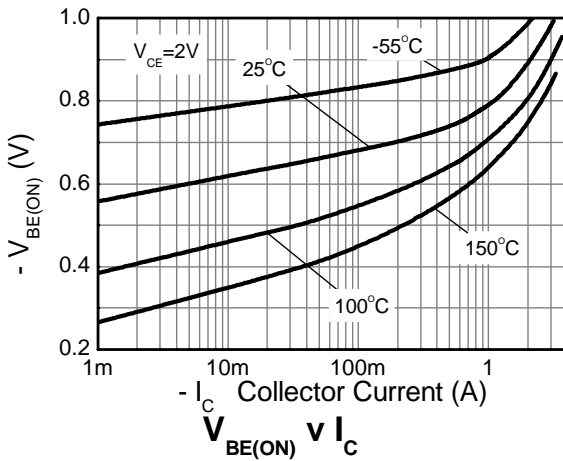
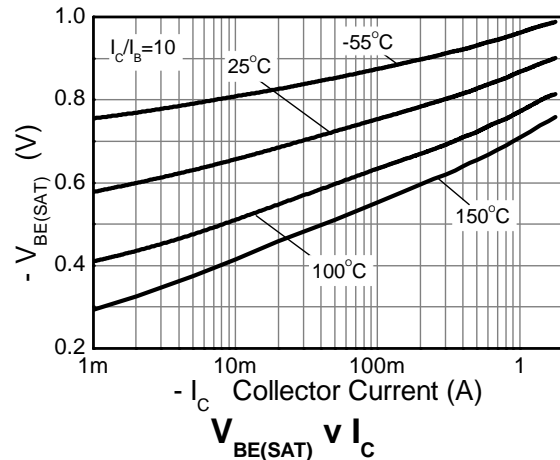
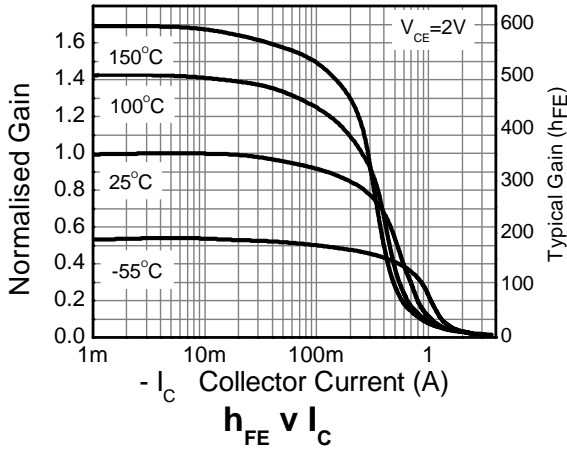
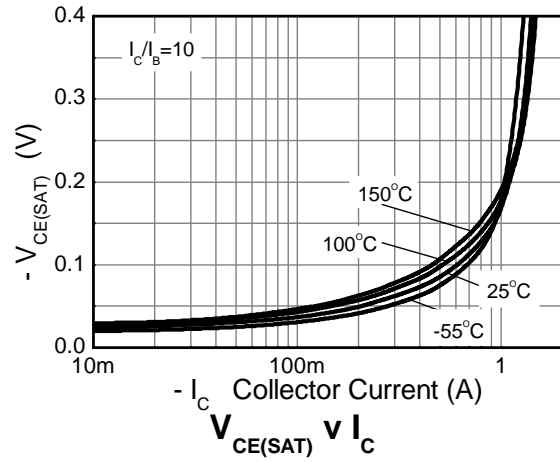
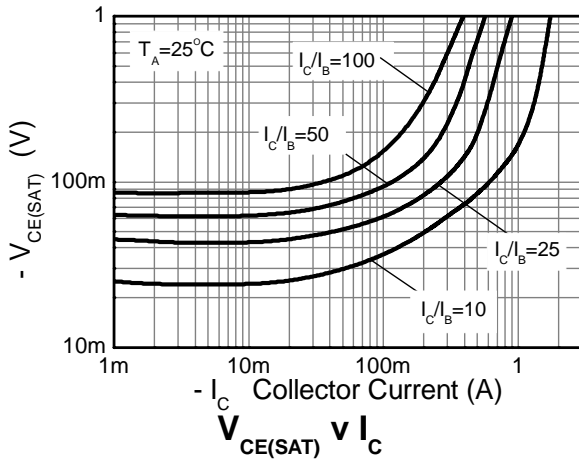


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-115	-180	-	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV <sub>CEO</sub>	-100	-140	-	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.4	-	V	I <sub>E</sub> = -100μA
Emitter-Base Breakdown Voltage	BV <sub>ECX</sub>	-7	-8.3	-	V	I <sub>E</sub> = -100μA, R <sub>BC</sub> < 1kΩ or -0.25 < V <sub>BC</sub> < 0.25V
Emitter-Base Breakdown Voltage	BV <sub>ECO</sub>	-7	-8.8	-	V	I <sub>E</sub> = -100μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	-	< -1	-50	nA	V <sub>CB</sub> = -115V
		-	-	-0.5	μA	V <sub>CB</sub> = -115V, T <sub>A</sub> = +100°C
Collector-Emitter Cutoff Current	I <sub>CEX</sub>	-	-	-100	nA	V <sub>CE</sub> = -90V, R <sub>BE</sub> < 1kΩ or -0.25V < V <sub>BE</sub> < 1V
Emitter-Base Cutoff Current	I <sub>EBO</sub>	-	< -1	-50	nA	V <sub>EB</sub> = -5.6V
Static Forward Current Transfer Ratio (Note 11)	h <sub>FE</sub>	200	350	500	-	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -2V
		180	320	-		I <sub>C</sub> = -100mA, V <sub>CE</sub> = -2V
		110	190	-		I <sub>C</sub> = -500mA, V <sub>CE</sub> = -2V
		20	35	-		I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V
Collector-Emitter Saturation Voltage (Note 11)	V <sub>CE(SAT)</sub>	-	-140	-210	mV	I <sub>C</sub> = -100mA, I <sub>B</sub> = -1mA
		-	-80	-110		I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
		-	-180	-310		I <sub>C</sub> = -500mA, I <sub>B</sub> = -20mA
		-	-150	-220		I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(SAT)</sub>	-	-849	-950	mV	I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(ON)</sub>	-	-790	-900	mV	I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V
Output Capacitance	C <sub>obo</sub>	-	14.1	20	pF	V <sub>CB</sub> = -10V, f = 1MHz
Transition Frequency	f <sub>T</sub>	-	180	-	MHz	V <sub>CE</sub> = -15V, I <sub>C</sub> = -20mA, f = 100MHz
Delay Time	t <sub>D</sub>	-	15.8	-	ns	V <sub>CC</sub> = -10V, I <sub>C</sub> = -500mA, I <sub>B1</sub> = -I <sub>B2</sub> = -50mA
Rise Time	t <sub>R</sub>	-	41	-	ns	
Storage Time	t <sub>S</sub>	-	411	-	ns	
Fall Time	t <sub>F</sub>	-	89	-	ns	

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%.

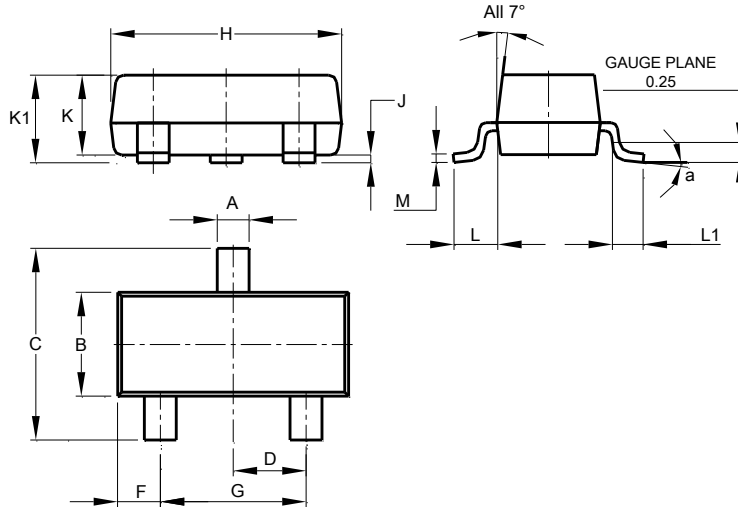
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**

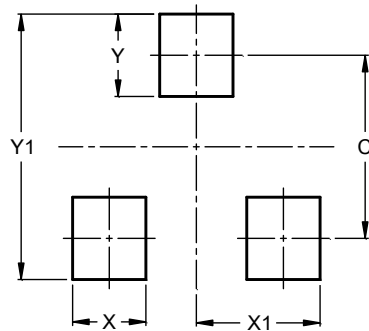


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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